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By: J. Michael Neary Date: Oct. 16, 2007  
J. Michael Neary

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Gerald J. Julien  
Serial No.: 10/505,356  
File Date: Aug. 19, 2004  
Title: "Nitinol Ice Blades"

Art Unit: 3618  
Examiner:  
John Daniel Walters

TRANSMITTAL LETTER  
BRIEF ON APPEAL

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Transmitted herewith are the following documents:

- Brief on Appeal (13 pages)
- Credit Card Authorization Form

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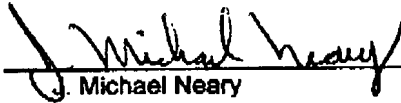
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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

## CERTIFICATE OF TRANSMISSION

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By:

  
Michael Neary

Oct 16, 2007

Date: Oct 16, 2007

Inventor(s): Gerald J. Julien )  
Serial No.: 10/505,356 ) Group A.U. 3818  
Filing Date: August 19, 2004 ) Examiner: John Daniel Walters  
Title: Nitinol Ice Blades )

## Brief on Appeal

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

October 16, 2007

Sir:

**1) Real party in interest**

Nitinol Technologies, Inc., assignee of this Application, is the real party in interest.

**2) Related Appeals and Interferences**

Applicants know of no related interferences or appeals that would directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

**3) Status of Claims**

Claims 1-12 were the original claims in this application. Claim 5 was canceled in a Response following a Restriction Requirement dated Sept. 1, 2006, and claims

13-15 were added in that same Response. In an Amendment under Rule 111 filed on January 17, 2007, new claims 16-20 were added. Claims 6-12 were allowed in the Final Office Action. Claims 1-4 and 13-20 stand finally rejected.

**4) Status of Amendments**

No amendments have been filed in this Application since the Final Office Action.

**5) Summary of Claimed Subject Matter**

There are two independent claims on appeal, claims 1 and 13. A concise explanation of the claimed subject matter in each of these claims follows, referring to the specification by page and line number and to the drawings by reference characters and figure numbers.

Claim 1 calls for an ice skate blade 30, 40, 50 (Figs. 1, 5, 9; page 5, lines 16, 21, 26) having an elongated blade body 52 (Fig. 9; page 5, line 25) with a main blade portion and an edge portion 44, 56 (Figs. 5-8, page 5, line 21, 28) made from Type 60 Nitinol. The edge portion of the blade body has an ice-contacting bottom edge. The main blade portion has structure 32, 54 (Figs. 1, 9; page 18, 26) pages for engaging a blade holder. The bottom edge has opposed corners that are sharpened to bite into ice to facilitate travel and maneuvering on the ice. The main blade portion has an impact strength of greater than 45 foot-pounds and a hardness greater than about 40 RC.

Claim 13 calls for an ice skate 20 (Fig. 1, page 5, line 16) having an elongated blade body 52 (Fig. 9; page 5, line 25) with a main blade portion and an edge portion 44, 56 (Figs. 5-8, page 5, line 21, 28) made from Type 60 Nitinol. The edge portion of the blade body has an ice-contacting bottom edge. The main blade portion has structure 32, 54 (Figs. 1, 9; page 18, 26) engaged in a blade holder 26 that is fastened to a boot 23 (Fig. 1, page 5, line 16). The bottom edge has opposed corners that are sharpened to bite into ice to facilitate travel and maneuvering on the ice. The main blade portion has an impact strength of greater than 45 foot-pounds and a hardness greater than about 40 RC.

**6) Grounds of Rejection to be Reviewed on Appeal**

A) Whether the rejection of claims 1-4 and 13-20 as unpatentable over Applicant's disclosure in view of Abkowitz (USPN 6,318,738) was proper.

**7) Argument**

Claims 1-4 and 13-20 have been rejected under 35 USC 103 as unpatentable over Applicant's own disclosure in view of Abkowitz et al (P/N 6,318,738) on the ground that Applicant's disclosure states that certain elements of an ice skate are conventional and well known, and that Abkowitz discloses a titanium alloy skate blade, and therefore it would have been obvious to make an ice skate blade out of 60 Nitinol.

Abkowitz specifies skate blade materials made of a titanium alloy "which is reinforced by a hard constituent" (col 2, lines 5-6). He specifically mentions an alloy of titanium, aluminum and vanadium with titanium carbide particles dispersed therein. He also discloses a titanium skate blade clad in "high hardness" oxidized zirconium (col 3, lines 17-18). He states that these materials offer high hardness for good edge retention and wear resistance. Abkowitz does not disclose or suggest the use of 60 Nitinol as a skate blade material, even though it was known at the time of his invention.

Applicant asserts that it would not have been obvious to a person of ordinary skill in the art to use Type 60 Nitinol for an ice skate blade because the physical properties of 60 Nitinol, specifically its low modulus and its low load resistance in conventional three-point bending tests, and also its low hardness, appear to make it a worse candidate for skate blades than conventional steel or the special high hardness titanium alloy composites disclosed by Abkowitz. High hardness and "strength" are factors that Abkowitz cited as desirable in his skate blade materials but are lacking in 60 Nitinol (at least in some definitions of "strength", such as conventional three-point bending tests used by the industry), so Abkowitz actually teaches away from the use of a material like 60 Nitinol. Moreover, 60 Nitinol is much more expensive than steel and is much harder to cut and sharpen, so making blades out of 60 Nitinol is much more difficult, and sharpening the blades with conventional

grinding wheels is almost impossible. These considerations would be enough to convince a person of ordinary skill in the art that 60 Nitinol would be a poor candidate for skate blade material.

In a Declaration under Rule 132 by Susan Buchanan, President of Triumph Sport, Inc., licensee of this Application, Ms Buchanan recounts the experience of Triumph Sport in trying to promote Nitinol skate blades. This Declaration is powerful evidence refuting the Examiner's conclusion that the use of 60 Nitinol would be obvious to a person of ordinary skill in the art for use in skate blades. The Examiner eventually acknowledged receipt of this Declaration but dismissed the evidence in it of the reaction of actual experts in the art to the possibility of using 60 Nitinol as skate blades, preferring his own opinion that a reference that shows use of titanium would make obvious the use of ANY material having titanium as a constituent.

Even if a person of ordinary skill in the art were determined enough to actually make and test skate blades made of 60 Nitinol, in spite of the evident factors noted above indicating the undesirability of 60 Nitinol as a skate blade material, he would quickly conclude that it would not be suitable for skate blades. Type 60 Nitinol skate blades feel different to skaters than conventional steel blades, as explained in detail in Ms. Buchanan's Rule 132 Declaration. They feel like dull steel blades and skaters feel unstable on the blades, even when standing in a neutral position. Why this is so is not known for certain. It may be the low modulus of 60 Nitinol, or the low coefficient of friction, or a combination of those and other characteristics. In any case, it takes several hours to get used to the different way skates with 60 Nitinol blades feel on the ice and, without knowing that the performance will be better after becoming accustomed to the way the Nitinol skate blades feel, a person of ordinary skill in the art would reject them as inferior to convention skate blades. In fact, experts in the art have come to the same conclusion and have rejected 60 Nitinol blades for this combination of reasons.

These notions about how those of ordinary skill in the art would react to the idea of using 60 Nitinol for skate blades are not merely Applicant's opinions. They have, unfortunately, been proven in painful experience during the promotion efforts of Applicant's licensee, Triumph Sport, Inc., as set forth in detail in the aforesaid

Declaration under Rule 132 by the President of Triumph Sport, Inc., Susan Buchanan. This Declaration describes the reaction of CCM, also known as Sport Maska, Inc., one of the biggest skate manufacturers in the world, to the offer of 60 Nitinol skate blades for CCM's skates. It should be noted that CCM did not identify 60 Nitinol as a potential skate blade material even though it had existed since the early 1980's; it was brought to their attention by Triumph Sport. CCM did not need to discover how to make skate blades from 60 Nitinol; the sample blades were supplied by Triumph Sport from samples supplied by Applicant. CCM did not have to learn how to sharpen the 60 Nitinol blades; the special grinding wheels and processes were supplied by Triumph Sport. Yet, even after being lead by the hand through all the difficult steps that the Examiner assumes to have been obvious to a person of ordinary skill in the art, CCM (some of the world's foremost experts in skating) concluded that 60 Nitinol skates do not afford any significant benefits, and they declined to consider that matter any further. CCM were not the only experts who declined the offer by Triumph Sport to adopt 60 Nitinol skate blades.

If experts like CCM and others in the industry can conclude that 60 Nitinol is not a suitable material for skate blades, even after having the benefits explained to them in detail and having sample blades provided, Applicant can only conclude that a person of ordinary skill in the art, lacking the extensive experience and accumulated knowledge of a leader in the skating industry, would not come to any wiser conclusion. There is no better test of what is obvious to a person of ordinary skill in the art than the actual reaction of experts in the art. The test of obviousness is not the perception of extraordinary visionaries like Applicant and Applicant's licensee Susan Buchanan, but what would have been obvious to persons of ordinary skill in the art. Applicant believes that the experts in the skating industry have proven conclusively that the use of 60 Nitinol for skate blades was unobvious, even after being introduced to it in great detail. The mere fact that 60 Nitinol existed along with hundreds of thousands of other potentially usable materials certainly would not have been sufficient to make it obvious to a person of ordinary skill in the art, especially in view of the very substantial apparent disadvantages that would attend its use.

The Examiner's position is that "Abkowitz specifically and directly states that titanium alloys are appropriate materials for use in skate blades." In fact, the teaching in Abkowitz is use of an ice skate blade comprised of a titanium material **"reinforced with a hard constituent"**. The Examiner omits that important additional feature, which is in all of the claims in the reference and in every example taught by Abkowitz. The Examiner seems to think that a teaching of the use of a titanium alloy "which is reinforced by a hard constituent" such as an alloy of titanium, aluminum and vanadium with titanium carbide particles dispersed therein, or a titanium skate blade clad in "high hardness" oxidized zirconium would make obvious any other material having any titanium, for use as a skate blade, regardless of its properties. In fact, those skilled in the art of designing and making skate blades are primarily interested in the properties of the material, not its chemical composition, as the Rule 132 Declaration of Ms Buchanan makes abundantly clear.

One issue that Ms Buchanan did not mention in her Declaration was the reaction of expert skaters that she was trying to recruit to test the new 60 Nitinol skate blades when they learned that these blades were made of a titanium alloy. (In fact, 60 Nitinol is not an alloy at all; it is an intermetallic compound.) Titanium alloy skate blades have a terrible reputation among expert skaters, and Ms. Buchanan had a big job convincing some of these experts to even try these skate blades because they already "knew" how bad titanium blades were. In fact, titanium blades are almost nonexistent on the market, notwithstanding the Abkowitz patent.

The Examiner concentrates on the titanium in 60 Nitinol, but 60 Nitinol has more nickel than titanium. Why did the Examiner not reject the claims because nickel is a constituent used in much skate blade material - stainless steel? Why is the use of 60 Nitinol for skate blades not made obvious by the prior use of stainless steel? Shouldn't every material in which nickel is a constituent also be obvious for skate blades, even if by every other criteria of patentability it would be considered patentable? Suppose an alloy of lead and nickel turned out to be a perfect material for skate blades against every expert's expectations. Would the existence of nickel in that material make it unpatentable because nickel is known to be useful in stainless steel which is a known skate blade material? By the Examiner's reasoning, the use

of a material having a constituent used in any other material ever used for that application would, ipso facto, make it obvious to a person of ordinary skill in the art regardless of a host of factors demonstrating unobviousness in fact. Applicant believes that the Examiner's reasoning is not and should not be the law.

Independent claims 1 and 13 both call for the main blade portion to have an impact strength of greater than 45 foot-pounds and a hardness greater than about 40 RC. There is no disclosure in Abkowitz about the corresponding physical properties of his powdered metal titanium alloy with embedded particles of TiC or cladding of zirconium oxide. The Examiner has not made any effort to show that these properties would have been obvious to a person of ordinary skill in the art, apparently because he has concluded that this is a property of Applicant's material and that he considers that ANY material containing titanium would have been obvious in view of the Abkowitz reference.

Claims 2 and 14 call for the main blade portion to have a tensile strength of greater than 130KSI and an elastic elongation of more than 3%. These are very unusual properties for metals. There is nothing in Abkowitz that would lead a person of ordinary skill in the art to look for a material that has these properties.

Claims 3 and 15 calls for the blade body to have a hardness between about 48RC and 55RC. Titanium has a low hardness of about 34 RC, which is why Abkowitz uses zirconium oxide cladding on his blade bodies. A person of ordinary skill in the art following the teachings in Abkowitz would add some sort of hard constituent as a cladding, or hard particles such as titanium carbide to the titanium as taught by Abkowitz. They would not use 60 Nitinol because in its as-cast state it is much too brittle to use as a skate blade material without Applicant's heat treating process.

Claim 16 calls for the main blade portion to have a Young's modulus that is lower than the Young's modulus of steel. Why would a skate manufacturer or any other person skilled in the art want a material with a lower Young's modulus than steel? There is no teaching anywhere in Abkowitz about how Young's modulus affects skating, whether it should be high or low or anything about Young's modulus, and he does not disclose the Young's modulus of the material he discloses and

claims. Thus, Applicant does not understand how Abkowitz can be a reference against claim 16 when it does not address the subject of claim 16 in any way.

Claim 17 calls for the main blade portion to have a higher damping capacity than steel. There is no teaching anywhere in Abkowitz about how the damping capacity of the blade material affects skating, whether it should be high or low or anything about the damping capacity of the blade material, and he does not disclose the damping capacity of the blade material he discloses and claims. Thus, Applicant does not understand how Abkowitz can be a reference against claim 16 when it does not address the subject of claim 17 in any way.

Claim 18 calls for the main blade portion to have a lower coefficient of friction on the ice than steel does. Abkowitz does not address this question, although it is likely that he would assert it as a benefit if it were true for his skate blade material and he knew about it. There is no teaching of the coefficient of friction of titanium materials on ice and there is nothing in Abkowitz that would lead a person of ordinary skill in the art to use titanium for skate blades because of its coefficient of friction on ice.


Claim 19 calls for the edge portion of the blade body to be heat treated to have a smooth and hard oxide finish on bottom and side edges thereof that is harder and smoother than the main blade portion, and has a lower coefficient of friction to produce glide and running properties on ice, superior to steel. The running edge of Abkowitz does in fact have a "hard oxide finish" that is harder than the material of the main blade portion, but it is not "heat treated" to have that oxide finish. The oxide finish on Applicant's blade is created by heating the blade ("heat treating", not by applying a different material. The oxide is created by oxidation of the 60 Nitinol material of the blade itself. There is no teaching of this process in Abkowitz, and there is no basis for believing that heat treating the blade material of Abkowitz would produce any such hard, smooth and slippery oxide.

Claim 20 calls for the blade body to be heat treated to reduce brittleness and improve toughness and impact strength, and give the skate blade an elastic property called ultraelasticity. There is nothing disclosed in Abkowitz that is remotely like this subject matter.

Accordingly, Applicant believes that the claims in this application do define subject matter that is patentable over the prior art and respectfully requests the Board to reverse the Examiner's rejection and to remand this application back to him for issue.

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**9) Claims Appendix**

1. An ice skate blade, comprising:  
an elongated blade body having a main blade portion and an edge portion made from Type 60 Nitinol;  
said edge portion of said blade body having an ice-contacting bottom edge;  
said main blade portion having structure for engaging a blade holder;  
said bottom edge having opposed corners that are sharpened to bite into ice to facilitate travel and maneuvering on said ice;  
said main blade portion having an impact strength of greater than 45 foot-pounds and a hardness greater than about 40 RC.
2. An ice blade as defined in claim 1, wherein:  
said main blade portion has a tensile strength of greater than 130KSI and an elastic elongation of more than 3%.
3. An ice blade as defined in claim 1, wherein:  
said blade body has a hardness between about 48RC and 55RC.
4. An ice blade as defined in claim 1, wherein:  
said ice blade is an ice skate blade, and said blade holder is affixed to an ice skate boot;  
said structure for engaging a blade holder includes structure on a top edge, opposite to said bottom edge, for engaging said blade holder of said ice skate boot.
13. An ice skate, comprising:  
an elongated blade body having a main blade portion and an edge portion made from Type 60 Nitinol;  
said edge portion of said blade body having an ice-contacting bottom edge;  
said main blade portion having structure engaged in a blade holder that is fastened to a boot;

said bottom edge having opposed corners that are sharpened to bite into ice to facilitate travel and maneuvering on said ice;

said main blade portion having an impact strength of greater than 45 foot-pounds and a hardness greater than about 40 RC.

14. An ice skate as defined in claim 13, wherein:

said main blade portion has a tensile strength of greater than 130KSI and an elastic elongation of more than 3%.

15. An ice blade as defined in claim 13, wherein:

said blade body has a hardness between about 48RC and 55RC.

16. An ice skate as defined in claim 13, wherein:

said main blade portion has a Young's modulus that is lower than the Young's modulus of steel.

17. An ice skate as defined in claim 13, wherein:

18. An ice skate as defined in claim 13, wherein:

said main blade portion has a lower coefficient of friction on the ice than steel.

19. An ice skate as defined in claim 13, wherein:

said edge portion of said blade body heat treated to have a smooth and hard oxide finish on bottom and side edges thereof that is harder and smoother than said main blade portion, and has a lower coefficient of friction to produce glide and running properties on ice superior to steel.

20. An ice skate as defined in claim 13, wherein:

said blade body is heat treated to reduce brittleness and improve toughness and impact strength, and give the skate blade an elastic property called ultraelasticity.

**9. Evidence Appendix**

No evidence was submitted under §§1.130, 1.131, or 1.132 of 37 CFR. No evidence (other than the cited prior art) was entered by the examiner and relied upon by Applicants.

**10. Related Proceedings Appendix**

No decisions were rendered by a court or the Board in any proceedings identified pursuant to 41 CFR 37(c)(1)(ii).